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ABSTRACT

This paper addresses the neuropsychological evaluation of impulsive aggression in emotionally disturbed students. Specific complications of organic aggressive syndrome include its unpredictable nature and basis in organic etiology. Characteristically, there is a sudden onset of unprovoked rage and violence accompanied by a drastic change in affect. The most significant functional disorder, post-traumatic stress disorder, is often associated with head injury and increasingly seen as a primary source of substance abuse in adolescents. Determining the site of organic brain damage may require sophisticated medical technology and examination of the role of neurotransmitters. Distinguishing between an organic disorder and such functional disorders as post-traumatic stress disorder and substance intoxication can be difficult. Functional disorders are significantly more amenable to successful treatment than are organic disorders. Criteria of the Diagnostic and Statistical Manual III--Revised for these various conditions are detailed. Also described is the Overt Aggression Scale which allows teachers, parents, and clinicians to provide a quick objective rating of verbal and physical aggression. Includes 33 references. (DB)

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NEUROPSYCHOLOGICAL FACTORS IN THE EVALUATION AND TREATMENT OF CHILDHOOD AND ADOLESCENT AGGRESSION

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A significant feature of the deinstitutionalization process is the marked increase in the home care and community (including public schools) treat ment of emotionally disturbed and developmentally disabled infants, chil dren and youth. It is widely recognized that the community mental health center (CMHC) network has failed in its mandate to replace institutions in the treatment of these individuals (French, 1987). This, in turn, places the onus for diagnosis and treatment upon the school system as mandated through the "child find" process (PL 89-313 & PL 94-142). While this process has fared well relevant to the identification (finding), classifica tion (coding), and treatment (special education) of learning disabled (LD) and developmentally disabled (MR) children and youth, it has not been very successful in the treatment of the "seriously emotionally disturbed" (SED) school-age population. And for good reason. Primary and secondary edu cational facilities are just not geared toward clinical treatment. Yet under the current service delivery system the schools are often placed into the position of primary care providers (French, 1986a; 1986b; 1986c).

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Given this social reality it is imperative that the issues surrounding the most unpredictable and critical emotional disorders afflicting this age-class be addressed with relevance to the schools. These emotional disor ders fall within the generic classification of "impulsive aggression." The most difficult class of impulsive aggression is the "organic aggressive syndrome." Here the aggression is both unpredictable and difficult to treat due to the innate biochemical nature (organic etiology). With chil dren and youth within the school setting the concern is significant due to the potential for and intensity of personal harm (self or other directed) and/or property damage associated with this syndrome (Silver & Yudofsky, 1987). The most significant "functional" disorder associated with impul sive aggression with children and youth is the "post-traumatic stress dis order" (PTSD). To complicate matters the PTSD is often linked to physical trauma which can include head (organic) injury. IT is also being increas ingly seen as a primary source of substance abuse in adolescents.

UNDERSTANDING IMPULSIVE AGGRESSION

The recent advent of medical technology, notably computed tomography (CT-scan), magnetic resonance imaging (MRI), and radioisotope imaging (PET/scan) allows for significant advances in neuropsychology today. But even prior to the development of the CT scan in 1973 scholars drew

attention to the problem of impulsive aggression among children and youth -- especially those with epilepsy (Gunberg & Pond, 1957; Nuffield, 1961; Pollack, 1967; Ounsted, 1967). Other early areas of study included vio lence and epilepsy among adult criminal offenders (Fenton & Udwin, 1965; Gunn & Bonn, 1971; Rodin, 1973; Klingman & Goldberg, 1975; Lewis, 1975) and violence secondary to drug intoxication (LSD, alcohol, narcotics, amphetamines) (Valzell, 1967; Ellinwood, 1971; Baden, 1972; Sadow, 1973).

Interestingly, the organic aggressive syndrome dates back to 1899, four years after Roentgen discovered X-rays. Later termed the "episodic dsycontrol syndrome" by Karl Menninger, the organic aggressive syndrome is classified as "organic personality disorder - explosive type" in the DSM-III-R. Other major clinical syndromes associated with outbursts of aggression or rage include substance intoxication (alcohol, cocaine, inhal ant, sedative, hypnotic or anxiolytic intoxication), intermittent explosive disorders, post-traumatic stress disorders and primary degenerative dementia. Impulsive aggression is also seen as a feature of organic affec tive disorders (organic mood syndrome - manic state) (Spitzer, 1987; Elliott, 1987).

The major feature of these impulsive aggressive disorders is the

sudden onset of violence with little or not warning accompanied by a drastic change in personality (affect). The violence itself is often primi tive, brutal, sudden and with considerable accuracy (on target). If there are any antecedents (school or work demands, being corrected or mildly reproached...) the resulting physical aggression is greatly disproportionate to these causal factors.

The prospects of school-aged children being afflicted with organic or functional impulsive aggressive disorders is far greater than what we thought in the past. This is due to the greater awareness surrounding child abuse (post-traumatic stress disorder) as well as the greater num ber of mentally ill and mentally retarded children being mainstreamed into the schools and community (French, 1986b; 1986c). Indeed, fears associated with the deinstitutionalization of "dangerous" emotionally dis turbed people fueled research in this area and with interesting results. Silver and Yudofsky, for example, noted that : "significant neuropsychiat ric impairment has been documented in seriously delinquent children, ado lescents arrested for murder, and prisoners with violent behavior (1987:386)." Given this social/clinical phenomenon clearly early detec tion and treatment must occur as early as possible. Public Laws 89-313 (child find process) and 94-142 (education for all handicapped children)

provide the intended network for a viable prevention program. However, for this process to be affective we must first have an understanding of what we currently understand impulsive aggressive disorders to be.

The single distinguishing feature of the organic aggressive syndrome is a seemingly unprovoked explosive rage. This departs from reactive aggression -- that clearly precipitated by antagonistic factors (Tardiff, 1984; French, 1985-86). And when substance abuse is involved in the rage it is believed that the drug, and possibly other agents such as aspartame, tend to lower the epileptic threshold thereby exacerbating both the onset and intensity of unprovoked rage (Langevin, et. al., 1987). Moreover, the organic aggressive syndrome is associated with certain types of brain lesions -- notably those located in the frontal lobe, temporal (sides) lobes and the occipital area (back and base of the brain). The etiology of aggressive epilepsy can be due to prenatal, neonatal, or postnatal factors as well as to brain injury sustained later in life (injuries, wounds, medi cal interventions, such as lobotomies). In latent epilepsy among children and youth environmental stressors, including school demands, can exacer bate the onset of seizure activity and subsequent aggressive outbursts (Elliot, 1976; Gardner & Cote, 1987).

Exacting the location and type of organic brain damage is a difficult

clinical task even with the recent advent of computed tomography, mag netic resonance, and radioisotope imaging. In addition to lesions, infarc tions and hemotomas to the brain a host of skull injuries can also contrib ute to craniocerebral trauma. Included here are linear, diastatic, commi nuted, depressed compound, and blow-out fractures and cysts secondary to skull fractures.

Biochemical explanations for the organic aggressive syndrome focus primarily upon the role neurotransmitters play in the biochemical pro cesses within the brain. Inferring from animal research it appears that acetylcholine (the first known neurotransmitter - discovered in the 1920's) contributes to increased aggression due to its link with the autonomic (involuntary) nervous system synapses. Eichelman (1987) sees the relationship between aggression and acetylcholine as an enhancement of central cholinergic activity. Dopamine, the neurotransmitter discov ered in 1958 and associated with schizophrenia, also appears to influence aggressive behaviors through its transmission of catechalomine. Psycho motor stimulants, such as amphetamine, methylphenidate (a mild psycho motor stimulant), and cocaine are potential releasers of Dopamine and, in high dosages, can induce a paranoid psychosis as can Dopamine drugs (L-Dopa) (Kaplan & Sadock, 1985). On the other hand, GABA (Gamma-Amino-

Butyric Acid) and serotonin are two neurotransmitters whose function seems to be to reduce aggression. Some studies claim that therapeutic dosages of benjodiazepines have a calming effect on aggressive behaviors through its enhancement of central GABAergic activity, while other studies indicate that lithium is effective against aggression because of its apparent ability to increase the uptake of serotonin precursor, trypto phan, in the brain (Eichelman, 1987).

As stated earlier when speaking of aggression among children and youth we must also take into consideration tow major functional disor ders whose clinical features mimic the organic aggressive syndrome. These are the post-traumatic stress disorder (PTSD) and alcohol and drug intoxication (the clinical category of "psychoactive substance-induced organic mental disorder actually fall within the area of organic syn dromes). Either clinical disorder, in itself, can produce the same sudden, intense aggressive reaction greatly disproportionate to real world stress ors. Indeed, clinicians treating violent (aggressive/suicidal) adolescents for substance abuse are finding that a substantial number of these indi viduals were the victim of child abuse (sexual, physical or psychological trauma as a child) and that drinking and/or drug abuse are often merely an associated feature. Substance abuse is seen as a form of self-medication

in an attempt to cope with the anxiety surrounding the earlier child abuse- - much of which was suppressed (a post-traumatic reaction).

Again, research with lower primates indicates that trauma, such as that experienced by humans suffering from the post-traumatic stress dis order, can alter the neurophysiology of neurotransmitters in the brain -- notably Dopamine and norepinephrine. Together, these neurotransmitters increase the sensitivity of the neuroreceptors (accounting for the dispro portionate paranoid delusion associated with minor stressors) as well as initiating the "flight or fight" autonomic mode of the Central Nervous Sys tem (this accounts for the impulsiveness and intensity of the aggression). The current thinking is that alcohol, amphetamines, and cocaine induce similar neurophysiological changes involving these neurotransmitters. The difference, however, between the changes associated with drug intox ication and PTSD and that linked with the organic aggressive syndrome is that there is some evidence to indicate an eventual reversal (normal sta bilization with in the brain chemistry) regarding substance intoxication and PTSD following successful treatment. The promise for such success with people afflicted with the organic aggressive syndrome is not as promising although some hope hinges upon the use of beta blockers and in the use of surgical interventions (such as severing the corpus collusum in

an attempt to prevent interictal transmission of epileptic seizures during acute attacks) (Elliot, 1987; Green & Costain, 1981; Hartman, 1987; Langevin et. al., 1987; Nace, 1987; Roth, 1985; Silver & Yudofsky, 1987; Yudofsky et. al., 1987).

Clearly few schools are capable of providing such intense neuropsychological or neuropsychiatric screening for those coded children with the potential for impulsive aggressive disorders. The cost alone would be prohibitive. What is needed then is a quick clinical screening assessment which can identify potential candidates who can then be referred for a more comprehensive neurological or psychiatric work up. A step in this direction is an understanding of the clinical criteria surrounding the major impulsive aggressive disorders.

The DSM-III-R lists the following criteria for the Organic Personality Syndrome.

A. A persistent personality disturbance, either lifelong or representing a change or accentuation of a previously characteristic trait, involving at least one of the following:

1. affective instability, e.g., marked shifts from normal mood to depression, irritability, or anxiety.

2. recurrent outbursts of aggression or rage that are grossly

out of proportion to any precipitating psychosocial stressors.

3.markedly impaired social judgment, e.g., sexual indiscretions.

4. marked apathy and indifference.

5. suspiciousness or paranoid ideation.

B. There is evidence from the history, physical examination, or lab oratory tests of a specific organic factor(s) judged to be etiologically related to the disturbance.

C. This diagnosis is not given to a child or adolescent if the clinical picture is limited to features that characterize Attention-deficit Hyper activity Disorder. (The Attention-deficit Hyperactivity Disorder does not include sudden and recurrent outbursts of aggression or rage. Initiating physical fights, however, is No. 8 in the descending list of 13 character istics associated with Conduct Disorders for your 18 or younger. Again this feature should not be confused with sudden and seemingly unprovoked outbursts or aggression or rage).

The Intermittent Explosive Disorder and Intoxication with Psychoac tive Substances also fit within the organic Aggressive Syndrome.

The diagnostic criteria for the Post-traumatic Stress Disorder are:

A. The person experienced an event that is outside the range of usual

human experience and that would be markedly distressing to almost any one (rape or assault; military combat; natural or accidental disasters; torture...).

B. The traumatic event is persistently reexperienced in at least one of the following ways:

1. recurrent and intrusive distressing recollections of the event (in young children, repetitive play which themes or aspects of the trauma are expressed).

2. recurrent distressing dreams of the event.

3. sudden acting or feeling as if the traumatic event were recur ring (flashbacks, illusions, hallucinations...).

4. intense psychological distress at exposure to events that symbolize or resemble an aspect of the traumatic event, including anniversaries of the trauma.

C. Persistent avoidance of stimuli associated with the trauma or numbing of general responsiveness (not present before the trauma), as indicated by at least three of the following:

1. efforts to avoid thoughts or feelings associated with the trauma.

2. efforts to avoid activities or situations that arouse recollections of the trauma.

3. Inability to recall an important aspect of the trauma (psychological amnesia).

4. markedly diminished interest in significant activities (in young children, loss of recently acquired developmental skill such as toilet training or language skills).

5. feeling of detachment or estrangement from others.

6. restrictive range of affect, e.g., does not expect to have a career, marriage, or children, or a long life.

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by at least two of the following:

1. difficulty falling or staying asleep.

2. irritability or outbursts of anger.

3. difficulty concentrating

4. hypervigilance

5. exaggerated startle response.

6. physiologic reactivity upon exposure to events that symbolize or resemble an aspect of the traumatic event (e.g., a woman who was raped in an elevator breaks out in a sweat when entering any elevator). (Spitzer, 1987).

Another tool there is the overt Aggression Scale which provides a

quick objective rating of verbal and physical aggression. It can be readily used by teachers, parents and clinicians in determining behavioral base lines and in behavioral analysis. The OAS is divided into four parts: (1) verbal aggression; (2) physical aggression again objects; (3) physical aggression against self; and (4) physical aggression against other people. Behaviors are then rated according to their severity within these categories.

1. Verbal Aggression:

   - makes loud noises, shouts angrily.
   - yells mild personal insults, e.g., "you're stupid!"
   - curses viciously, uses foul language in anger, makes moderate threats to others of self.
   - makes clear threats of violence toward others or self ("I'm going to kill you!") or requests to help to control self.

2. Physical Aggression against Objects

   - slams door, scatters clothing, makes a mess
   - throws objects down, kicks furniture without breaking it, marks the wall.
   - breaks objects, smashes windows.
   - sets fires, throws objects dangerously.

3. Physical Aggression against Self:

   - picks or scratches skin, hits self, pulls hair (with no or minor injury only).
   - bangs head, hits fists into objects, throws self onto floor or into objects (hurts self without serious injury).
   - small cuts or bruises, minor burns.
   - mutilates self, causes deep cuts, bites that bleed, internal injury, fractures, loss of consciousness, loss of teeth.

4. Physical aggression again Other People:

   - makes threatening gestures, swings at people, grabs at clothes.
   - strikes, kicks, pushes, pulls hair (without injury to them.
   - attacks others, causing mild-moderate physical injury (broken bones, deep lacerations, internal injury) (Yudofsky, et. al., 1986).

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